Claims

[c1] What is claimed is:

1. A pre-subject filter having variable attenuation in two dimensions for a radiographic imaging system, the filter comprising:

a first end having a first attenuation profile;

a second end having a second attenuation profile, the second attenuation profile being larger than the first attenuation profile; and

a body connecting the first end and the second end.

[c2] 2. The filter of claim 1 wherein the first end further includes a filtering width narrower than a filtering width of the second end.

[c3] 3. The filter of claim 1 wherein the body has an attenuation profile such that the attenuation power decreases continuously from the first end to the second end.

[c4] 4. The filter of claim 1 having a shaped cross-section.

[c5] 5. The filter of claim 1 being translated in at least one of a z-axis and a transverse axis of a CT system.

[c6] 6. A CT system comprising:

rotatable gantry having an opening defining a scanning bay;

a movable table configured to translate a subject to be scanned along a first axis within the scanning bay;

an x-ray projection source configured to project x-rays projected toward the subject;

a pre-subject filter to filter x-rays projected toward the subject, the filter having a variable attenuation profile; and

a computer programmed to:

determine an attenuation pattern of the subject;

translate the filter along the first axis as a function of the attenuation pattern of the subject; and

acquire imaging data of the subject.

[c7] 7. The CT system of claim 6 wherein the computer is further programmed to translate the filter in a transverse direction as a function of the attenuation

pattern of the subject.

[c8] 8. The CT system of claim 7 wherein the computer is further programmed to position the filter as a function of the attenuation pattern of the subject to reduce radiation exposure to dose reduction regions of the subject.

[c9] 9. The CT system of claim 8 wherein the dose reduction regions include anatomical regions sensitive to radiation.

[c10] 10. The CT system of claim 6 wherein the computer is further programmed to determine the attenuation pattern of the subject from a set of patient projections.

[c11] 11. The CT system of claim 6 wherein the computer is further programmed to move the filter as a function of gantry rotation.

[c12] 12. A method of diagnostic imaging comprising the steps of:
positioning a subject to be scanned into a scanning bay;
projecting a radiation beam along a beam path toward the subject;
positioning a filter having variable attenuation in the beam path;
translating the filter in at least one direction to reduce radiation exposure to sensitive anatomical regions of the subject;
acquiring imaging data of the subject; and
reconstructing an image of the subject from the imaging data.

[c13] 13. The method of claim 12 wherein the filter includes:
a first end having a first attenuation profile;
a second end having a second attenuation profile, the second attenuation profile being greater than the first attenuation profile; and
a body connecting the first end and the second end.

[c14] 14. The method of claim 13 wherein the first end has a filtering width narrower than a filtering width of the second end.

[c15] 15. The method of claim 13 wherein the body has a variable attenuation profile that varies continuously along a length of the body from the first end to the second end.

[c16] 16. The method of claim 13 wherein the body has a width that tapers from the second end to the first end.

[c17] 17. The method of claim 16 wherein the attenuation profile of the body varies non-linearly across any given constant width of the body.

[c18] 18. A radiographic imaging system comprising:
a scanning bay;
a movable table configured to move a subject to be scanned fore and aft along a first direction within the scanning bay;
an x-ray projection source configured to project x-rays in an x-ray beam toward the subject;
a pair of cam filters formed of attenuating matter; and
a computer programmed to:
determine a region-of-interest of the subject; and
position the pair of cam filters to limit x-ray exposure outside the region-of-interest.

[c19] 19. The radiographic imaging system of claim 18 wherein each cam filter has a length and an attenuation profile that varies as a function of filter length

[c20] 20. The radiographic imaging system of claim 19 wherein the attenuation profile of each filter is a function of filter thickness

[c21] 21. The radiographic imaging system of claim 20 wherein the computer is further programmed to translate at least one of the filters in the first direction to either increase or decrease x-ray exposure to the region of interest.

[c22] 22. The radiographic imaging system of claim 18 wherein the pair of cam filters is oriented in an x-axis.

[c23] 23. The radiographic imaging system of claim 18 wherein each cam filter has an elliptical shape.

[c24] 24. The radiographic imaging system of claim 18 wherein the computer is further programmed to decrease a space between the pair of filters to narrow the x-ray beam and increase the space between the pair of filters to widen the

x-ray beam.

[c25] 25. A cam filter assembly for use with a radiation emitting imaging system, the cam filter assembly including a pair of cam filters wherein each cam filter has an attenuation power that varies with thickness of the filter, the pair of cam filters being configured to operate in tandem to manipulate a beam of radiation projected toward a subject to limit radiation exposure to a region-of-interest of the subject.